EU 2030 Targets "Unachievable" Without Long-Term Nuclear Operation

NucNet and
Maria van der Hoeven | Page 12

Nuclear energy will continue to support greenhouse gas emission reduction targets until 2020, but without decisions on long-term operation of ageing reactors, it will be difficult for the *EU* to meet its 2030 targets, *International Energy Agency (IEA)* executive director Maria van der Hoeven, tells *NucNet* in an interview.
The *IEA* has quite a few remarks and questions related to the *EU* goals of competitiveness, security of supply and sustainability. It is good to have these targets, but up until now the *EU* is missing the direct connection between the three goals. What is mostly needed to achieve the goals is to finalise the *EU's* internal energy market. Secondly cost-effective climate and energy policies are needed because it is not only about climate and energy, but also about economic development and competitiveness.
The ageing *EU* reactor fleet requires country-level and owner/operator-level decisions in the short term regarding plant safety regulations, plant upgrades, uprates, lifetime extensions and licence renewals. Upgrading and uprating existing nuclear plants is one of the cheapest ways of producing carbon-free electricity in the *EU*. Without long-term operation, the *IEA* expects nuclear capacity in the *EU* could fall by a factor of six by 2030 and that will make it more difficult to achieve the *EU's* 2030 climate targets.
Public opinion is an important topic for the acceptance of all energy sources and it is different in all *IEA* member countries. Europe is very sensitive to almost all forms of energy, including wind turbines and solar panels. This is linked to a lack of information, so we need more and better transparency on information for people.

Overview of PHARE Projects Implemented in Romania Between 1997 and 2008 for Enhancing the Nuclear Safety Level

Radian Sanda, Benoit Zerger,
Giustino Manna and
Brian Farrar | Page 14

Through the *Poland Hungary Aid for Reconstruction of the Economy (PHARE)* programme, the *European Commission (EC)* supported the transition of the Eastern European states to the European market economy. PHARE was a pre-accession financial assistance programme which involved countries from Central and Eastern Europe that applied to become members of the European Union. The paper presents a synthesis of the projects carried out in Romania for enhancing nuclear safety by consolidating key areas such as Regulatory Activities, Radioactive Waste Management and On-Site assistance, in order to fulfil the requirements for accession to the *European Union*.
Statistical considerations on the impact of the projects are also proposed and an analysis of the methodology of intervention is made.

Nuclear Power Plant Olkiluoto 3 Containment Leakage Test Under Extreme Conditions

Tobias Fleckenstein | Page 22

Modern nuclear power plants place high demands on the design and execution of safety checks. *TÜV SÜD* supported the containment leakage test for the largest-capacity third generation nuclear power plant in the world – *Olkiluoto 3* in Finland. The experts successfully met the challenges presented by exceptional parameters of the project. The containment of *Olkiluoto 3* is unique in that the vessel's volume is 80,000 m^3 while measurements were carried out over a period of ten days. To execute the test, 75 temperature and 15 humidity sensors had to be installed and correctly interlinked by more than ten kilometres of cable. These instruments also needed to withstand an absolute pressure of 6 bar, ambient temperatures of 30° C and high levels of humidity. These conditions required comprehensive preparation and a high amount of qualification tests. Parts of the qualifications were carried out at the autoclave system of the Technical University in Munich, Germany, where the project test conditions could be simulated. The software required to determine the tests was developed by *TÜV SÜD* and verified by German's national accreditation body DAkkS under ISO 17025.
TÜV SÜD enabled the test schedule to continue without delay by analysing all recorded data continuously on site, including pressure, temperature, humidity and leakage mass flow curves. With the comprehensive preparation, data acquisition system recording measurements continuously and the on-time result calculation, all components of the leak-tightness assessment were successfully completed in accordance with requirements.

Paradigm Shift in Transport Legislation or Rather at the „Bottleneck"

Hanns Näser | Page 25

In the year just started significant decisions with considerable consequences by the Federal Constitutional Court and the Federal Administrative Court in the field of nuclear law are expected. Especially the decision with regards to „nuclear phase-out" within the 13th amendment of the Atomic Energy Act is being eagerly expected, as with its far-reaching consequences also fundamental constitutional questions need to be answered.
The Federal Administrative Court will need to decide on the question, whether she admits the appeal against the Brunsbüttel decision by the Higher Administrative Court Schleswig-Holstein (HAC), which from the view of claimant shifted the fundamental basis of demarcation of responsibilities between the executive and judiciary power.
In comparison to these fundamental decisions the awaited decision by the HAC on nuclear transport legislation seems of subordinate importance, although she will proceed with a paradigm shift in the legal area. The decision deals with the question as to whether and when a right of action from a third party within the nuclear transport legislation can be accepted or more precisely under which preconditions a third party has clear standing against a nuclear transport authorisation.
As the site selection law (issued on 23 July 2013 BGBI I p. 2552) excludes the recirculation of vitrified waste block canisters from reprocessing spent fuel elements to the transport cask storage facility Gorleben, the decision by the HAC Lüneburg for this site will only be relevant for present unpredictable transportations from the transport cask storage facility Gorleben to a final repository. If necessary interest to seek a declaratory judgment for declaratory action, in concreto danger of recurrence will be approved, is another matter.

Completeness Assessment of General Safety Requirements for Sodium-Cooled Fast Reactor Nuclear Design Utilizing Objective Provision Tree

Namduk Suh, Moohoon Bae,
Yongwon Choi, Bongsuk Kang and
Huichang Yang | Page 27

A prototype sodium-cooled fast reactor (SFR) of 150 MWe is under development in Korea. The designer is planning to apply the licensing for construction permit by 2020. To prepare the future licensing review, we are developing general safety requirements for SFR. The requirements are developed first by evaluating the applicability of the current requirements of light water reactor (LWR) to SFR and then taking into account other international requirements available. In this way, we have developed a draft general safety requirements with 59 articles. The LWR safety requirements are coming from the accumulated experiences of long-year licensing and operation, but we do not have sufficient experiences corresponding for SFR, so we need a systematic and integral approach to complement our developed requirements for SFR. For this purpose, we have developed an objective provision tree for the safety function of reactivity control and applied it in assessing the completeness of our draft requirements developed. In this way, we could confirm that our draft requirements include all the requirements to prevent the mechanisms that could challenge the safety function of reactivity control.

RMB: The New Brazilian Multipurpose Research Reactor

José Augusto Perrotta and Adalberto Jose Soares | Page 30

Brazil has four research reactors (RR) in operation: IEA-R1, a 5 MW pool type RR; IPR-R1, a 100 kW TRIGA type RR; ARGONAUTA, a 500 W Argonaut type RR, and IPEN/MB-01, a 100 W critical facility. The first three were constructed in the 50's and 60's, for teaching, training, and nuclear research, and for many years they were the basic infrastructure for the Brazilian nuclear developing program. The last, IPEN/MB-01, is the result of a national project developed specifically for qualification of reactor physics codes. Considering the relative low power of Brazilian research reactors, with exception of IEAR1, none of the other reactors are feasible for radioisotope production, and even IEA-R1 has a limited capacity. As a consequence, since long ago, 100% of the Mo-99 needed to attend Brazilian nuclear medicine services has been imported. Because of the high dependence on external supply, the international Moly-99 supply crisis that occurred in 2008/2009 affected significantly Brazilian nuclear medicine services, and as presented in previous IAEA events [1], in 2010 Brazilian government formalized the decision to build a new research reactor. The new reactor named RMB (Brazilian Multipurpose Reactor) will be a 30 MW open pool type reactor, using low enriched uranium fuel. The facility will be part of a new nuclear research centre, to be built about 100 kilometres from São Paulo city, in the southern part of Brazil. The new nuclear research centre will have several facilities, to use thermal and cold neutron beams; to produce radioisotopes; to perform neutron activation analysis; and to perform irradiations tests of materials and fuels of interest for the Brazilian nuclear program. An additional facility will be used to store, for at least 100 years, all the fuel used in the reactor. The paper describes the main characteristics of the new centre, emphasising the research reactor and giving a brief description of the laboratories that will be constructed, It also presents the status of the project.

AMNT 2014: Key Topic | Reactor Operation, Safety – Report Part 3

| Page 34

Summary report on the following sessions of the Annual Conference on Nuclear Technology held in Frankfurt, 6 to 8 May 2014:

- Reactor Operation, Safety: Radiation Protection (Angelika Bohnstedt)
- Competence, Innovation, Regulation: Fusion Technology – Optimisation Steps in the ITER Design (Thomas Mull)
- Competence, Innovation, Regulation: Education, Expert Knowledge, Knowledge Transfer (Jörg Starflinger)

The other Sessions of the Key Topics "Reactor Operation, Safety", "Competence, Innovation, Regulation" and "Fuel, Decommissioning & Disposal" have been covered in *atw* 10 and 12 (2015) and will be covered in further issues of *atw*.

60th year atw: Foreword of the First Issue in 1956

Siegfried Balke, Heinrich Freiberger, Karl Hecht, W.A. Menne, Herbert Seidl und Kurt Sauerwein | Page 50

The present journal will in detail and with objective clarity report on all economic questions with regard to nuclear transformation. The information will be extensive and concentrated and will cover economic contexts including news, legal questions as well as questions on operational and social safety. Especially its documentation, which sighted and reliably provides a pictures of the happenings in Germany and the most important countries in the world, will inform the reader quick and briefly in an intelligible language.
Thus the *ATOMWIRTSCHAFT* should serve above all a serious and concentrated reporting and should be a conscientious advisor on a new promising field of work of science and technics beyond German speaking regions.

The Federal Republic of Germany and the International Cooperation in the Nuclear Field

Franz Josef Strauß | Page 51

The questions of international cooperation in the field of nuclear energy for peaceful purposes arise the increasing interest of all political and economic interested parties of our nation. This rising sympathy reflects the awareness, that due to the fast development of nuclear energy, in detail a hardly assessable process, a new technical revolution is in the offing which for the further economic development of the European states and not least our country itself will be in view of the current inferior position in comparison to the leading nuclear powers, of paramount importance. By all necessity of catching up the scientific and technical development at national level, the conviction is more and more confirmed that joint efforts both in the European and global area are necessary to make full use of the tremendous possibilities of nuclear energy for peaceful progress.
It is appropriate and valuable, already for determining the own point of view for the further participation in international cooperation within the nuclear field, to gain from time to time an overview and to take stock on existing organisation as well as different projects and plans. For this purpose the following lines are intended, without demanding completeness in all details. I may initially pay attention to the entirely or predominant economic committees for cooperation followed by bilateral and multilateral facts and projects.

IAEA Puts Cyber Security in Focus for Nuclear Facilities in 2015

John Shepherd | Page 66

Later in 2015 the *International Atomic Energy Agency (IAEA)* will convene a special conference to discuss computer security, in the wake of cyber attacks on global financial institutions and government agencies that were increasingly in the news.
According to the *IAEA*, the prevalence of *IT* security incidents in recent years involving the Stuxnet malware "demonstrated that nuclear facilities can be susceptible to cyber attack". The *IAEA* said this and other events have significantly raised global concerns over potential vulnerabilities and the possibility of a cyber attack, or a joint cyber-physical attack, that could impact on nuclear security.
The *IAEA* has correctly identified that the use of computers and other digital electronic equipment in physical protection systems at nuclear facilities, as well as in facility safety systems, instrumentation, information processing and communication, "continues to grow and presents an ever more likely target for cyber attack".
The agency's Vienna conference, to be held in June, will review emerging trends in computer security and areas that may still need to be addressed. The meeting follows a declaration of ministers of *IAEA* member states in 2013 that called on the agency to help raise awareness of the growing threat of cyber attacks and their potential impact on nuclear security.
The conference is being organised "to foster international cooperation in computer security as an essential element of nuclear security", the *IAEA* said.
Details of the *IAEA's 'International Conference* on *Computer Security in a Nuclear World:* Expert Discussion and Exchange' are on the 'meetings' section of the agency's web site.